MATH/STAT 3360, Probability
Fall 2014
Toby Kenney

Instructor:	Toby Kenney Department of Mathematics and Statistics Chase Building, Room 202 email: tkenney@mathstat.dal.ca
Course Website:	`www.mathstat.dal.ca/~tkenney/3360/2014/`
Office Hours:	Monday 14:30-15:30, Wednesday 14:30-15:30 & Thursday 14:30-15:30
Lectures:	TT: 13:05-14:25 LSC C238
Topics:	discrete and continuous distributions, properties of random variables, law of large numbers, central limit theorem
Textbook:	"A First Course in Probability" (Ninth Edition) by Sheldon Ross published by Prentice Hall, 2013

Course Work and method of assessment

There will be a midterm exam and a final exam. The midterm will be held in class on Thursday 23rd October, and should cover the material in Chapters 1–5. This may be changed, depending on the progress in lectures. The final exam will be scheduled by the Registrar's Office during the examination period: Thursday 4th to Sunday 14th December.

There will also be (approximately) weekly homework assignments, which must be handed on Thursdays in the lecture. After this, I will put the model solutions on the course website. **No credit can be given for late homework.** The overall homework mark will be made up of an average of the weekly homework marks, with the exception of the worst mark for each student.

The homework sheet will be divided into 2 sections: The *basic questions* section tests the basic concepts covered in the course: everyone should be able to do all these questions. The *standard questions* section has questions where the concepts covered in the course can be applied to more realistic situations, or questions which involve a stronger theoretical insight; these questions are mostly straightforward, though there may be the occasional tricky question included. There may also be some *bonus questions* section has questions which are either more challenging, or else raise interesting or important issues that are not central to this course.

Sometimes a question will be started on one sheet, but continued on the following sheet, after the relevant material has been covered. In this case, the full question will be given on the earlier sheet, but the parts that should only be attempted with the later sheet are clearly marked, and are repeated on the later sheet. For some questions, I may occasionally give out a hint, rather than a complete model solution. Revised answers to these questions may then be submitted with the following week's homework.

Grades will be determined by performance in the exams and the weekly homeworks. The midterm exam counts for 30%, the final counts for 55%, while the homework counts for the remaining 15%. You must pass the final exam to obtain a passing grade in the course.

Weekly Readings

Since class time is limited, I will be using it for explaining concepts and going over examples, rather than reading through the textbook. You should therefore read through the relevant sections of the textbook *before* the lecture, in order to gain the full benefit from the lecture. The sections of the textbook that

will be covered each lecture will be listed on the website. This list may be updated from time to time, depending on the progress made in earlier lectures. Here is the current plan.

Week beginning	Tuesday	Thursday
1st September		Introduction
8th September	1.2 Basic Principle of Counting (Multiplication Principle, Rule of product), 1.3 Permutations, 1.4 Combinations	1.5 Multinomial Coefficients, 2.2 Sample Spaces & events, 2.3 Axioms of Probability, 2.4 Simple Propositions
15th September	2.5 Sample Spaces of Equally Likely Events, 2.6 Probability as a Continuous Set Function, 2.7 Probability as a Measure of Belief	3.2 Conditional Probability, 3.3 Bayes Formula
22nd September	3.4 Independant Events, 3.5 $P(.\|F)$ is a probability	4.1 Random Variables, 4.2 Discrete Random Variables , 4.3 Expected Value
29th September	4.4 Expectation of a Function of a Random Variable, 4.5 Variance,4.6 Bernoulli & Binomial Random Variables, 4.7 Poisson Random Variables	4.9 Expectation of Sums of Random Variables, 4.10 Cumulative Distribution Functions
6th October	5.1 Continuous Random Variables, 5.2 Expectation and Variance of Continuous Random Variables, 5.3 Uniform Random Variables	5.4 Normal Random Variables
13th October	5.5 Exponential Random Variables, 5.7 Distribution of a Function of a Random Variable	Revision Chapters 1-5
20th October	Revision Chapters 1-5	MIDTERM EXAMINATION
27th October	6.1 Joint Distribution Functions, 6.2 Independent Random Variables	6.3 Sums of Independent Random Variables, 6.7 Joint Probability Distribution of Functions of Random Variables
3rd November	6.4 Conditional Distributions (Discrete), 6.5 Conditional Distributions (Continuous)	7.2 Expectation of Sums of Random Variables, 7.3 Moments of the Number of Events that Occur
10th November	STUDY DAY	7.4 Covariance, Variance of Sums and Correlation, 7.5 Conditional Expectation, 7.6 Conditional Expectation and Prediction
17th November	7.7 Moment Generating Functions, 7.8 Additional Properties of Normal Random Variables	8.2 Markov's Inequality, Chebyshev's Inequality and the Weak Law of Large Numbers, 8.3 The Central Limit Theorem
24th November	8.4 The Strong Law of Large Numbers, 8.5 Other Inequalities (One-sided Chebyshev Inequality, Chernoff Bounds)	Revision
1st December	Revision	END OF LECTURES

Sections of the text covered

We expect to cover most of the material in Chapters 1–8 in the textbook.

Students with disabilities

Students with disabilities are encouraged to register as quickly as possible at the Student Accessibility Services if they want to receive academic accommodations. To do so, plese 'phone 494-2836, email access@dal.ca, drop in at the Killam, G28, or visit our website at www.studentaccessibility.dal.ca.

Plagiarism

Plagiarism is a serious academic offense which may lead to loss of credit, suspension or expulsion from the university. Please read the Policy on Intellectual Honesty contained in the Calendar or on the Dalhousie web site at: http://www.registrar.dal.ca/calendar/ug/UREG.htm#12.

Dalhousie Writing Centre

Writing expectations at university are higher than you will have experienced at high school (or if you are entering a master's or PhD program, the expectations are higher than at lower levels). The Writing Centre is a Student Service academic unit that supports your writing development. Make an appointment to discuss your writing. Learning more about the writing process and discipline-specific practices and conventions will allow you to adapt more easily to your field of study.